

## LIFE FORMS AND BIOLOGICAL SPECTRUM OF THE FLORA OF JALAUN DISTRICT

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The biological spectrum of Jalaun is represented by life forms like 50.44% Therophytes, 17.2% Phanerophytes, 6.03% Chamaephytes, 5.76% Hydro-helophytes, 8.2% Lianas, 1.62% Hemicryptophytes, 14.97% Nanophanerophytes and 3.9% Geophytes. The phytoclimate of the district appears therophytic but in actual fact it is not so. Dominance of therophytes is due to overgrazing and deforestation. Total of 563 species were recorded.

Raunkiaer (1934) has given an extensive account of life form system in which the position of bud or plant propugules has been considered as the most important criterion for classification of plants into different life forms. Depending on this single character he classified the higher plants into five major categories viz. Phanerophytes (p) Chamaephytes (Ch) Hemicryptophytes (H) Cryptophytes (Cr) and Therophytes (Th.). The life forms are taken as indicator of climate and on the basis of life form composition of various floras, Raunkiaer, distinguished three main types of phytoclimates on the earth:-

1. Phanerophytic climate in the tropics
2. Therophytic climate in the desert
3. Hemicryptophytic climate in the greater part of the cold temperate zone.

The statistical distribution of life forms in the flora of a region is expressed in the form of a biological spectrum. Since the life forms are related to the environment around the plants, the biological spectrum is also regarded as indicative of the prevailing environment. The biological spectrum of different regions of India has been described by workers using Raunkiaer's life form classification. Meher-Homji (1964, 1981) has recognised ten types of phytoclimates for different regions of India.

### THE STUDY AREA

Jalaun in Bundelkhand was explored during 1985-88 for angiospermous flora. It is situated in Jhansi division (20° 27' and 25° 46' north latitude and 79° 52' and 70° 56' east longitude) and it covers 5740 sq. km. The climate of the district is typically

monsoonic marked by the high temperature during summer (approximately 42.2° c maximum temperature during May and low temperature during winter (approximately minimum temperature 9.4° c during January). The average annual rainfall is about 781.50 mm. The relative humidity is maximum in July-August, being 83.7% when it has sufficiently rained. March, April and May are the driest months of the year, when the relative humidity is lowest-18% .

### RESULTS AND DISCUSSION

In the present study, the system of Raunkiaer as modified by Ellenberg & Muller-Dombois (1974) has been followed. All the plant species of district Jalaun are grouped into the following life form categories. A total of 563 species were recorded.

*Phanerophytes* (ph.): Plants that grow taller than 2 m. or where shoots do not die back to that height limit in unfavourable period e.g. *Acacia nilotica* subsp. *nilotica*.

*Nanophanerophytes* (N) : These are shrubs smaller than 2 m. e.g. *Zizyphus nummularia*.

*Hemicryptophytes* (H): Plants whose periodic shoots are reduced to a remnant system that lies relatively flat on the ground surface e.g. *Cynodon dactylon*.

*Chamaephytes* (Ch): Plants whose shoots remain perennial within 50 cm. above ground surface or if it grows taller than 50 cm. then their shoots die back during unfavourable period . This applies mainly to those with erect or ascending shoots e.g. *Sida cordata*

*Geophytes* (G): Plants whose surviving organs are

usually well protected in the soil with periodic reduction of the complete shoot system to storage organs. These may be rhizomes, stem tubers, bulbs etc.

**Therophytes (Th)** : Annual plants that propagate through seeds and complete their life cycle within short period e.g. *Portulaca meridiana*.

**Hydro and Helophytes (HH)**: Aquatic and semi-aquatic plants e.g. *Nymphaea nouchali*, *Caesulia axillaris*.

**Lianas (L)** : These are climbers e.g. *Antigonon leptopus*.

**Parasites (P)** these are chlorophyllous or non chlorophyllous plants e.g. *Orobanche aegyptiaca*.

In the Table 1 the biological spectrum for the life forms of district Jalaun has been compared with normal spectrum given by Raunkiaer and that of Allahabad and Varanasi districts. Total number of species collected from the area is 563. The various life forms in the spectrum are Therophytes (284, 50.44%) Phanerophytes (98; 17.2%) Chamaephytes (34; 6.03%) Hydro-Helophytes (32; 5.76%) Lianas (46; 8.28%) Hemicryptophytes (9; 1.62%); Geophytes (22; 3.9%); Nanophanerophytes (28; 4.97%) and Parasites (3; 0.5%).

Table 1: Biological spectrum of Jalaun district and adjoining areas compared with normal spectrum

Region	Percentage distribution of life forms				
	Ph.	Ch.	H.	G.	Th.
Normal spectrum (Raunkiaer 1934)	46	9	26	4	13
Allahabad (Srivastava, 1944)	32.2	9.2	3.4	11.6	41.6
Varanasi (Singh & Ambasht 1975)	-	4.2	19.1	6.3	72
Jalaun (Present study)	17.2	6.03	1.62	3.9	50.44

From the Table 1, it is evident that therophytes constitute the highest percentage, which is more than two times of the normal spectrum. According to Dansereau (1957) the predominance of therophytes, indicates warm climate. The other important life forms

are phanerophytes and hydrophytes constituting 17.2% and 12.55 respectively. Since therophytes outnumber other life forms, the district Jalaun has therophytic phytoclimate. According to Raunkiaer's assessment, the climate of the area under study, like that of Gangetic plain, is well suited for forest development and the phanerophytes should be dominant.

Increase in the percentage of therophytes and decrease in that of phanerophytes, nanophanerophytes and hemicryptophytes in the flora of Jalaun district is caused by deforestation, intensive utilisation of land for cultivation and other purposes and grazing by livestock. The result of the present study is in conformity with the conclusion drawn by Meher-Homji (1981).

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